

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-13. (canceled)

Claim 14 (currently amended): ~~A thin core or coreless~~ An integrated circuit printed circuit board (IC-PCB) carrier package having ~~one of a thin core or coreless~~ a substrate, and a stiffener to provide stiffening support to the ~~one of a thin core and coreless~~ substrate, and wherein the substrate includes at least five layers, wherein the at least five layers include a first layer with a thickness between about 0.1 mm and 0.5 mm and at least four laminate layers, at least two of the laminate layers on a first side of the first layer and at least two of the laminate layers on a second side of the first layer, none of the laminate layers having a thickness greater than about 30 microns none of the layers having a thickness of greater than about 0.5 mm.

Claim 15 (currently amended): ~~A thin core or coreless~~ An IC-PCB carrier package as claimed in claim 14, the IC-PCB carrier package being one of a flip chip pin grid array (FC-PGA) or a flip chip ball grid array (FC-BGA).

Claim 16 (currently amended): ~~A thin core or coreless~~ An IC-PCT carrier package as claimed in claim 14, where the stiffener is substantially made of a ceramic material, is one of a molded, stamped, etched, extruded or deposited stiffener, and is capable of withstanding high temperatures of at least one of an IC die bonding operation and normal IC operation.

Claim 17 (currently amended): ~~A thin core or coreless~~ An IC-PCT carrier package as claimed in claim 14, the stiffener being planar and mounted to a die-side major planar surface of the substrate.

Claim 18 (currently amended): ~~A thin core or coreless~~ An IC-PCT carrier package as claimed in claim 14, the stiffener having an internal window therein to provide clearance for at least one of a die, under-fill, die side components (DSC), or integrated heat spreader (IHS).

Claim 19 (canceled)

Claim 20 (currently amended): ~~A thin core or coreless~~ An IC-PCT carrier package as claimed in claim 14, the stiffener having an above-substrate-plane height, which is less-than or equal to an above-substrate-plane height, when mounted, of one of: an IC-die, or a combination of an IC-die with an integrated heat spreader (IHS).

Claim 21 (currently amended): ~~A thin core or coreless~~ An IC-PCT carrier package as claimed in claim 14, the stiffener having a top surface above a substrate-plane, which is substantially co-planar with, when mounted, a top surface of a combination of an IC-die with an integrated heat spreader.

Claim 22 (currently amended): ~~A thin core or coreless~~ An IC-PCT carrier package as claimed in claim 21, the stiffener being disposable to co-support a heat sink, with a combination of an IC-die with an integrated heat spreader (IHS).

Claim 23 (currently amended): A thin core or coreless An IC-PCT carrier package as claimed in claim 14, where a main body of the stiffener is electrically conductive, the stiffener further includes an insulator to electrically insulate electrical members on stiffener-opposing areas of the substrate.

Claims 24-26 (canceled)

Claim 27 (currently amended): A packaged integrated circuit (IC) comprising: an IC, and a thin core or coreless an integrated circuit printed circuit board (IC-PCB) carrier package having ~~one of a thin core or coreless~~ a substrate, and a stiffener to provide stiffening support to the ~~one of a thin core and coreless~~ substrate, and wherein the substrate includes at least five layers, wherein the at least five layers include a first layer with a thickness between about 0.1 mm and 0.5 mm and at least four laminate layers, at least two of the laminate layers on a first side of the first layer and at least two of the laminate layers on a second side of the first layer, none of the laminate layers having a thickness greater than about 30 microns.

Claim 28 (previously presented): A packaged IC as claimed in claim 27, the IC-PCB carrier package being one of a flip chip pin grid array (FC-PGA) or a flip chip ball grid array (FC-BGA) carrier package.

Claim 29 (previously presented): A packaged IC as claimed in claim 27, where the stiffener is substantially made of a thermosetting plastic material.

Claim 30 (original): A packaged IC as claimed in claim 27, the stiffener being planar and mounted to a die-side major planar surface of the substrate.

Claim 31 (previously presented): A packaged IC as claimed in claim 27, the stiffener having an internal window therein to provide clearance for at least one of a die, under-fill, die side components (DSC), or integrated heat spreader (IHS).

Claim 32 (canceled)

Claim 33 (previously presented): A packaged IC as claimed in claim 27, the stiffener having an above-substrate-plane height, which is less-than or equal to an above-substrate-plane height, when mounted, of one of: an IC-die, or a combination of an IC-die with an integrated heat spreader (IHS).

Claim 34 (previously presented): A packaged IC as claimed in claim 27, the stiffener having a top surface above a substrate-plane, which is substantially co-planar with, when mounted, a top surface of a combination of an IC-die with an integrated heat spreader.

Claim 35 (previously presented): A packaged IC as claimed in claim 34, the stiffener being disposable to co-support a heat sink, with a combination of an IC-die with an integrated heat spreader (IHS).

Claim 36 (previously presented): A packaged IC as claimed in claim 27, where a main body of the stiffener is electrically conductive, the stiffener further includes an insulator to electrically insulate electrical members on stiffener-opposing areas of the substrate.

Claims 37-51 (canceled)

Claim 52 (currently amended): An electronic system comprising:

a packaged integrated circuit (IC) having an IC, and an a thin core integrated circuit printed circuit board (IC-PCB) carrier package having a thin core substrate, wherein the substrate includes at least five layers, wherein the at least five layers include a thin core first layer with a thickness between about 0.1 mm and 0.5 mm and at least four laminate layers, at least two of the laminate layers on a first side of the first layer thin core and at least two of the laminate layers on a second side of the first layer thin core, none of the laminate layers having a thickness greater than about 30 microns, and a stiffener to provide stiffening support to the thin core substrate;

a receiving socket to receive the packaged IC; and

at least one input/output device.

Claim 53 (previously presented): An electronic system as claimed in claim 52, the IC-PCB carrier package being one of a flip chip pin grid array (FC-PGA) and a flip chip ball grid array (FC-BGA) carrier package.

Claim 54 (previously presented): An electronic system as claimed in claim 52, where the stiffener is substantially made of at least one of a metal, plastic, glass or ceramic material, is an extruded stiffener, and is capable of withstanding high temperatures of at least one of an IC die bonding operation and normal IC operation.

Claim 55 (previously presented): An electronic system as claimed in claim 52, the stiffener being planar and mounted to a die-side major planar surface of the substrate.

Claim 56 (previously presented): An electronic system as claimed in claim 52, the stiffener having an internal window therein to provide clearance for at least one of a die, under-fill, die side components (DSC), or integrated heat spreader (IHS).

Claim 57 (canceled)

Claim 58 (previously presented): An electronic system as claimed in claim 52, the stiffener having an above-substrate-plane height, which is less-than or equal to an above-substrate-plane height, when mounted, of one of: an IC-die, or a combination of an IC-die with an integrated heat spreader (IHS).

Claim 59 (previously presented): An electronic system as claimed in claim 52, the stiffener having a top surface above a substrate-plane, which is substantially co-planar with, when mounted, a top surface of a combination of an IC-die with an integrated heat spreader.

Claim 60 (previously presented): An electronic system as claimed in claim 59, the stiffener being disposable to co-support a heat sink, with a combination of an IC-die with an integrated heat spreader (IHS).

Claim 61 (previously presented): An electronic system as claimed in claim 52, where a main body of the stiffener is electrically conductive, the stiffener further includes an insulator to electrically insulate electrical members on stiffener-opposing areas of the substrate.

Claim 62 (canceled)